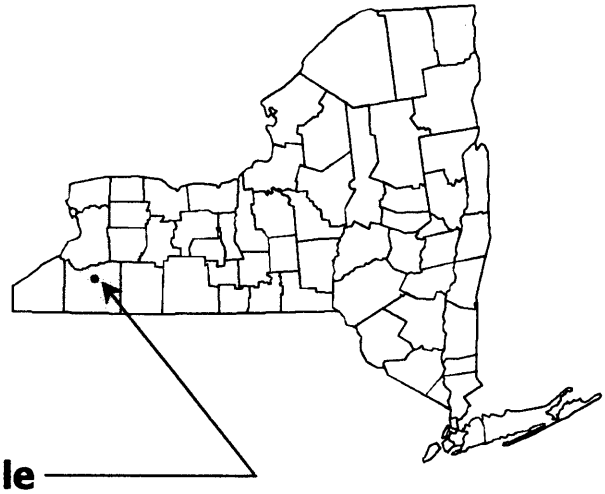
FLOOD INSURANCE STUDY

TOWN OF ELLICOTTVILLE, NEW YORK

CATTARAUGUS COUNTY



REVISED:
JANUARY 19, 2000

Federal Emergency Management Agency

COMMUNITY NUMBER - 360069

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision (LOMR) process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial FIS Effective Date: November 1977 (FIS report); May 15, 1978 (Flood Insurance Rate Map)

Revised FIS Date: August 2, 1995
January 19, 2000

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FLOOD INSURANCE STUDY
TOWN OF ELLICOTTVILLE, CATTARAUGUS COUNTY, NEW YORK

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates a previous FIS/Flood Insurance Rate Map (FIRM) for the Town of Ellicottville, Cattaraugus County, New York. This information will be used by the Town of Ellicottville to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). The information will also be used by local and regional planners to further promote sound land use and floodplain development.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

For the original, November 1977, FIS report and May 15, 1978, FIRM (hereinafter referred to as the original FIS), the hydrologic and hydraulic analyses were prepared by the New York State Department of Environmental Conservation (NYSDEC) for the Federal Emergency Management Agency (FEMA), under Contract No. H-3856. That work was completed in March 1977.

For the August 2, 1995, FIS report, the hydrologic and hydraulic analyses were prepared by Kozma Associates Consulting Engineers, P.C., for FEMA, under Contract No. EMW-90-C-3103. That work was completed in September 1991.

For this revision, the hydrologic and hydraulic analyses were prepared by Leonard Jackson Associates for FEMA, under Contract No. EMW-93-C-4145. This work was completed in February 1997.

1.3 Coordination

The purpose of an initial Consultation Coordination Officer's (CCO) meeting is to discuss the scope of the FIS. A final CCO meeting is held to review the results of the study.

For the original FIS, a search for basic data was made at all levels of government. The Soil Conservation Service (SCS) provided hydrologic and hydraulic information as well as previously surveyed cross section data of Great Valley Creek. The U.S. Geological Survey (USGS) was contacted to obtain contour maps showing drainage boundaries.

Information regarding flow data was not available from the USGS since there are no existing flow records in the area.

For the original FIS, an initial CCO meeting was held on July 30, 1975, and a final CCO meeting was held on February 8, 1977. Both of these meetings were attended by representatives of the town, the NYSDEC, the Cattaraugus County Planning Board, the SCS, and FEMA.

For the August 2, 1995, FIS, an initial CCO meeting was held on January 19, 1989, and attended by representatives of the NYSDEC, the town, and FEMA. A final CCO meeting was held on June 4, 1992, with representatives of Kozma Associates Consulting Engineers, P.C., the town, and FEMA.

For this revision, FEMA, NYSDEC, the New York Department of Transportation (NYSDOT), and the town were contacted for acquiring information. The community was notified by FEMA in a letter dated October, 21, 1997, that its FIS would be revised using the analyses prepared by Leonard Jackson Associates.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the incorporated area of the Town of Ellicottville, Cattaraugus County, New York. The area of study is shown on the Vicinity Map (Figure 1).

In the original FIS, Great Valley Creek was studied by detailed methods.

In the 1995 FIS, all or portions of the following streams were studied by detailed methods: Great Valley Creek, Elk Creek, Holiday Valley Creek, Plum Creek, and South Branch Plum Creek.

For this revision, Great Valley Creek was restudied by detailed methods from the upstream corporate limits of the Village of Ellicottsville to a point approximately 50 feet upstream of CSX transportation bridge.

Limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2). The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

All or portions of Great Valley Creek and Beaver Meadows Creek were studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and the Town of Ellicottville.

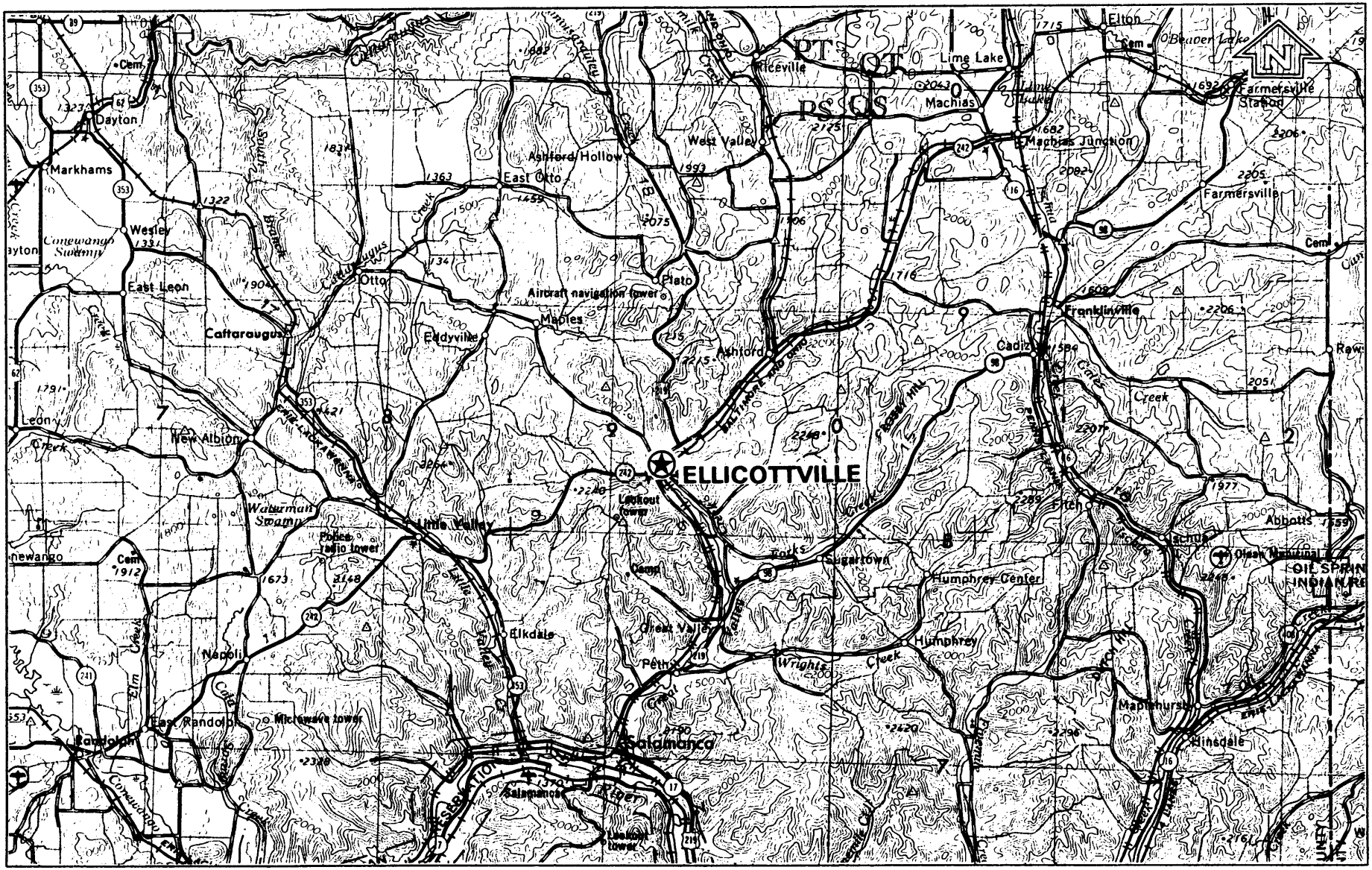


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF ELLICOTTVILLE, NY

(CATTARAUGUS CO.)

APPROXIMATE SCALE

4 0 4 8 12 MILES

VICINITY MAP

2.2 Community Description

The Town of Ellicottville is located in the central portion of Cattaraugus County in western New York State. It is bordered by the Towns of Machias and Franklinville to the east; Ashford to the north; Great Valley to the south; Mansfield to the west; and East Otto to the northwest. The town completely surrounds the Village of Ellicottville.

The town occupies a land area of 51 square miles. The 1998 population estimate for the Town of Ellicottville is 2,005 (Reference 1).

The topography of the town is varied, with flat land in the valley along the Great Valley Creek and in the Hinman Valley. There is a sizable wetland in the northeastern section of the town through which Beaver Meadows Creek flows. The remainder of the town is hilly, with steep, well-drained slopes. The elevation in the lowlands is approximately 1,520 feet and rises to elevations over 2,280 feet in the hills.

The climate of the region is greatly influenced by the Great Lakes and is characteristic of western New York, having cold, snowy winters and cool, wet summers. The average temperature in February is 20 degrees Fahrenheit (°F), while the average temperature in July is 66°F. The average annual precipitation is approximately 46 inches (Reference 2).

2.3 Principal Flood Problems

Flooding can occur in the town during any season of the year but is most likely to occur in the late winter or early spring months when melting snow may combine with intense rainfall to produce increased runoff.

There are no gages in the town. However, from records of the recording gage on Great Valley Creek in the Town of Great Valley two miles upstream from its mouth, it appears that the greatest flood of record on Great Valley Creek occurred on September 28, 1967. Although the recording gage was inundated and out of operation, the maximum flow has been estimated at 28,600 cubic feet per second (cfs), with a flood stage of 1,411.3 feet National Geodetic Vertical Datum of 1929 (NGVD) (Reference 3). The gage was discontinued the following year and its location cannot now be precisely determined due to a change in the stream channel since that time.

Other significant floods occurred in June 1972, on January 22, 1959, and on March 7, 1956.

2.4 Flood Protection Measures

The Town of Ellicottville has no known structural flood control measures. However, in an effort to minimize the risk of flood hazard, promote the public health, and minimize public and private losses due to flooding, the town has adopted Local Law No. 1, entitled "Flood Damage Prevention" (Reference 4).

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1-percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

In the 1995 FIS, for Great Valley Creek, a regional analysis using USGS stream gaging records for maximum peak flow data was prepared by the NYSDEC to establish exceedence-interval discharge relationships at selected points along the waterways of the Allegheny River basin for uncontrolled drainage areas larger than five square miles (References 5 and 6). For smaller areas, a Bureau of Public Roads technique was used to establish the hydrology (Reference 7). The statistical procedures used in this analysis are those proposed by Leo R. Beard, which utilize a log-Pearson Type III distribution as a base method for flood flow-frequency studies (Reference 8). This methodology conforms with the uniform techniques for determining flood flow-frequencies set forth by the Hydrology Committee of the U.S. Water Resources Council (Reference 9).

Stream flow records for Great Valley Creek are available from a gage located in the Town of Great Valley. However, the number of years for which data are available for the stream is too small to be used alone in determining a flood flow-frequency relationship. Gage data were used to calibrate synthetically-produced stream flows with historical flooding.

For Great Valley Creek, a synthetic rainfall-runoff relationship method based on a dimensionless unit hydrograph was used to develop flood flow-frequency relationships. The 24-hour rainfall amounts for frequencies up to 100 years, as obtained from the Rainfall Frequency Atlas of the United States, were plotted, and the rainfall amount for the 500-year frequency flood was extrapolated from the resulting graph (Reference 10).

The watershed of the creek was divided into sub-areas to evaluate the hydrologic effects of as many tributaries as would be significant. USGS maps were used to determine drainage boundaries (Reference 11). The SCS computer program TR-20 was used to compute surface runoff (Reference 12). Based on this program, frequency-discharge, drainage area curves were developed for each evaluation point.

For Elk Creek, Holiday Valley Creek, Plum Creek, and South Branch Plum Creek, the peak discharges of the selected recurrence interval were determined using the procedures and regression equations outlined in USGS Water Resources Investigations 79-83 for ungaged sites on gaged streams (Reference 13 and 14).

The following equation was used for Elk Creek, Holiday Valley Creek, Plum Creek, and South Branch Plum Creek:

$$Q = K(DA)x(St+10)-y$$

where Q is the stream discharge; DA is the drainage area; St is the percentage of total drainage area shown as lakes, ponds and swamps; and K, x, and y are functions of the frequency. The following values were used for the 100-year discharge: for k, 49,900; for x, 0.733; and for y, 2.03.

For this revision, no new hydrologic data were calculated.

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGE (cfs) 100-YEAR
GREAT VALLEY CREEK		
At downstream corporate limits	48.5	4,375
At upstream Village of Ellicottville corporate limits	39.8	3,700
At CSX Transportation	35.7	3,600

TABLE 1 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGE (cfs) 100-YEAR
ELK CREEK		
At Village of Ellicottville corporate limits	3.10	1,070
At the confluence of two unnamed tributaries near intersection with Maples Ellicottville Road and Poverty Hill Road	1.16	520
HOLIDAY VALLEY CREEK		
At confluence with Great Valley Creek	1.60	660
At confluence of an unnamed tributary	0.96	450
PLUM CREEK		
At Village of Ellicottville corporate limits	1.95	760
At confluence of South Branch Plum Creek	0.72	365
SOUTH BRANCH PLUM CREEK		
At confluence with Plum Creek	0.90	430

For the streams studied by approximate methods, the method published in Flood Height-Drainage Area Relation for 100-year Flood - New York Basins, was used (Reference 15). This method yields an approximate 100-year flood height as a depth of water above a contour crossing, or normal water-surface. The relationship used was developed for the Upper Genesee River Basin because no relationship has been developed for the Upper Allegheny River Basin in New York State. The Upper Allegheny and Upper Genesee River Basins are contiguous and similar geographically, geologically, and in land use and cover.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

In the original FIS, cross section geometry was obtained through field survey, as was the base line, which was used for horizontal control. Cross sections were located at close intervals above and below bridges, at control sections along the stream length, and at significant changes in ground relief, land use, or land cover. In the 1995 FIS, cross section data for the backwater analyses were obtained from topographic maps at a scale of 1:2,400, which were prepared from aerial photography (Reference 16). For the 1995 FIS, a portion of the cross section data for the backwater analyses for Holiday Valley Creek were obtained from topographic maps at scales of 1"=60' and 1"=200' (References 17 and 18). The below-water sections were obtained by field measurements. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the FIRM (Exhibit 2).

In the original FIS, water-surface elevations of floods of the selected recurrence intervals were computed using the SCS WSP-2 water-surface profiles computer program (Reference 19). In the 1995 FIS, water-surface elevation of floods of the selected recurrence interval were computed using the USACE HEC-2 step-backwater computer program (Reference 20). The HEC-2 model was calibrated using historic floodwater profiles.

Starting water-surface elevations for Great Valley Creek were computed using tailwater elevations on the Allegheny River in the Town of Great Valley. Starting water-surface elevations for Holiday Valley Creek and South Branch Plum Creek were calculated using the slope/area method. For Elk Creek and Plum Creek, the starting water-surface elevations were adopted from the FIS for the Village of Ellicottville (Reference 21).

For this revision, the HEC-2 model was revised to account for the new private drive bridge configuration at Stations 15.025-15.075 and divided flow caused by Route 219.

The starting water-surface elevation for the first cross section of the new model is the calculated water-surface elevation for the identical cross section in the original model.

Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. For the downstream portion of Plum Creek, which lies outside of the Town of Ellicottville corporate limits, please refer to the FIS for the Village of Ellicottville (Reference 21).

Channel roughness factors (Manning's "n") were chosen based on field inspection and based on the National Engineering Handbook (Reference 22). The range of channel and overbank "n" values for each of the streams studied by detailed methods is listed in the following tabulation:

Stream	Channel "n"	Overbank "n"
Great Valley Creek	0.025-0.065	0.055-0.090
Elk Creek	0.030-0.040	0.060-0.090
Holiday Valley Creek	0.030-0.035	0.045-0.090
Plum Creek	0.030-0.040	0.070-0.090
South Branch Plum Creek	0.025-0.040	0.070-0.085

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the NGVD. Elevation reference marks used in this FIS, and their descriptions, are shown on the maps.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 100- year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the streams studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section.

In the previous FIS, between cross sections, the boundaries of Great Valley Creek were interpolated using topographic maps developed from aerial photographs at a scale of 1''=400' with a contour interval of 5 feet (Reference 23). For a portion of Holiday Valley Creek the boundaries were interpolated using topographic maps at scales of 1''=40', with a contour interval of 2 feet; 1''=60'; and 1''=200', with a contour interval of 5 feet (References 24, 17, and 18). For the remaining portion of Holiday Valley Creek and the remaining streams studied by detailed methods, the floodplain boundaries were interpolated using topographic maps at a scale of 1:2,400 with a contour interval of 4 feet (Reference 16).

For this revision, floodplains were delineated on a combination of NYSDOT topographic mapping with a 5 foot contour interval and a scale of 1''=200' and effective mapping with a 4 foot contour interval and a scale of 1''=200' (References 25, 26, and 27).

For the streams studied by approximate methods, the 100-year floodplain boundaries were taken from the previously printed FIS/FIRM for the Town of Ellicottville (Reference 28).

The 100- and 500-year floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 100-year floodplain boundaries correspond to the boundaries of the areas of special flood hazard (Zones A and AE), and the 500-year floodplain boundaries correspond to the boundaries of areas of moderate flood hazard. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundaries have been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundaries are shown on the FIRM (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 2). The computed floodways are shown on the FIRM (Exhibit 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown. Portions of the floodway width for Great Valley Creek extend beyond the corporate limits.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Great Valley Creek								
A	4,610	230	1,119	4.6	1,521.3	1,521.3	1,522.1	0.8
B	5,715	300[2]	825	6.3	1,525.0	1,525.0	1,525.1	0.1
C	8,025	395	1,221	4.3	1,531.7	1,531.7	1,531.9	0.2
D	12,460	200	1,134	3.9	1,542.7	1,542.7	1,543.0	0.3
E	13,370	96	777	5.6	1,544.2	1,544.2	1,544.6	0.4
F	14,760	150	811	5.4	1,548.3	1,548.3	1,549.1	0.8
G	15,620	100	792	5.5	1,553.8	1,553.8	1,554.1	0.3

[1]Feet above corporate limits
[2]Width extends beyond corporate limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF ELLICOTTVILLE, NY
(CATTARAUGUS CO.)

FLOODWAY DATA

GREAT VALLEY CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Elk Creek								
A	200[1]	110	383	2.8	1,548.6	1,548.6	1,549.3	0.7
B	1,940[1]	105	218	4.9	1,563.9	1,563.9	1,564.0	0.1
C	3,620[1]	102	571	0.9	1,574.0	1,574.0	1,574.5	0.5
D	6,040[1]	44	158	3.3	1,579.7	1,579.7	1,580.6	0.9
E	7,535[1]	87	360	1.4	1,591.4	1,591.4	1,591.9	0.5
Holiday Valley Creek								
A	1,390[2]	16	88	2.7	1,523.5	1,523.5	1,523.5	0.0
B	1,520[2]	14	40	5.9	1,525.5	1,525.5	1,525.5	0.0
C	1,615[2]	31	42	5.7	1,526.1	1,526.1	1,526.1	0.0
D	2,228[2]	27	76	6.3	1,529.7	1,529.7	1,530.1	0.4
E	2,303[2]	27	99	4.9	1,530.7	1,530.7	1,531.0	0.3
F	2,400[2]	27	67	7.2	1,531.1	1,531.1	1,531.4	0.3
G	2,455[2]	21	53	9.1	1,533.2	1,533.2	1,533.2	0.0
H	2,720[2]	40	80	6.0	1,536.8	1,536.8	1,536.9	0.1
I	2,845[2]	25	56	8.6	1,540.3	1,540.3	1,540.3	0.0
J	4,170[2]	70	196	2.3	1,572.4	1,572.4	1,573.3	0.9
K	5,105[2]	12	42	10.7	1,606.6	1,606.6	1,607.0	0.4
L	6,200[2]	67	104	4.3	1,648.9	1,648.9	1,649.4	0.5
Plum Creek								
A	95[1]	26	81	9.3	1,601.4	1,601.4	1,601.4	0.0
B	680[1]	34	87	8.7	1,613.8	1,613.8	1,613.8	0.0
C	1,290[1]	32	82	9.2	1,630.1	1,630.1	1,630.1	0.0
D	2,830[1]	20	44	8.2	1,671.2	1,671.2	1,671.2	0.0
E	3,985[1]	67	68	5.4	1,713.0	1,713.0	1,713.0	0.0

[1]Feet above corporate limits
[2]Feet above downstream corporate limits of the Village of Ellicottville

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF ELLICOTTVILLE, NY
(CATTARAUGUS CO.)

FLOODWAY DATA

ELK CREEK – HOLIDAY VALLEY CREEK – PLUM CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
South Branch Plum Creek								
A	60	21	70	6.1	1,667.4	1,667.4	1,668.4	1.0
B	630	34	60	7.2	1,688.3	1,688.3	1,688.3	0.0
C	960	12	41	10.5	1,698.7	1,698.7	1,698.8	0.1
D	1,700	12	46	9.3	1,724.1	1,724.1	1,725.0	0.9
E	1,920	65	509	0.8	1,739.3	1,739.3	1,739.3	0.0

[1]Feet above confluence with Plum Creek

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

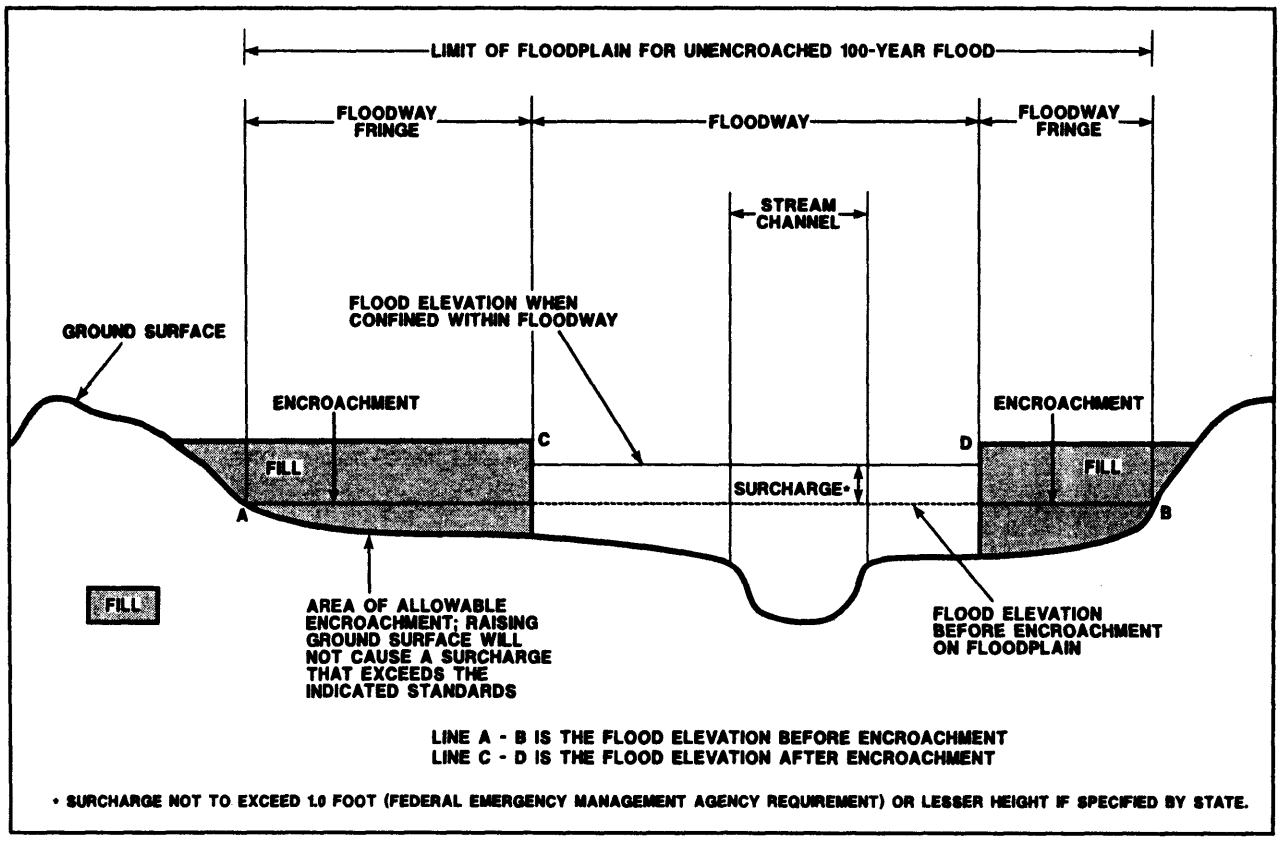
TOWN OF ELLICOTTVILLE, NY
(CATTARAUGUS CO.)

FLOODWAY DATA

SOUTH BRANCH PLUM CREEK

Encroachment into areas subject to inundation by floodwaters having hazardous velocities aggravates the risk of flood damage, and heightens potential flood hazards by further increasing velocities. A listing of stream velocities at selected cross sections is provided in Table 2, "Floodway Data." In order to reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside the floodway.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.



FLOODWAY SCHEMATIC Figure 2

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. The zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

7.0 OTHER STUDIES

FISs have been prepared for the Towns of Ellicottville, Franklinville, and Great Valley; and the Village of Ellicottville (References 28, 29, 30, and 21).

FIRMs have been prepared for the Towns of Ashford, East Otto, Machias, and Mansfield (References 31, 32, 33, and 34).

Because it is based on more up-to-date analyses, this FIS supersedes the previously printed FIS for the Town of Ellicottville (Reference 28).

The downstream end of this re-study matches the original FIS for the Village of Ellicottville. The upstream end of this re-study is consistent with the approximate study for the Town of Ellicottville (References 21 and 28).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, Mitigation Division, 26 Federal Plaza, Room 1351, New York, New York 10278.

9.0 BIBLIOGRAPHY AND REFERENCES

1. Population Estimates Program, Population Division, U.S. Bureau of the Census, Washington, D.C.

2. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climatological Data, Annual Summary, New York, Volume 101, No. 13, 1989.

3. U.S. Department of the Interior, Geological Survey, Surface Water Supply of the United States, Part 3 (Ohio River Basin), Periodic Summary.

4. Town of Ellicottville, Local Law No. 1, Flood Damage Prevention, by the Board of the Town of Ellicottville, Cattaraugus County, New York, 1987.

5. U.S. Department of the Interior, Geological Survey, Water Resources Data for New York (and Pennsylvania), Part 1 - Surface Water Records Annual.

6. New York State Department of Environmental Conservation, Allegheny River Basin - Peak Flow Regionalized Analysis, December 1975.

7. W. D. Potter, "Use of Indices in Estimating Peak Rates of Runoff," Public Roads, Volume 28, No. 1, Pages 1-8, April 1954.

8. Leo R. Beard, Statistical Methods in Hydrology, Sacramento, California, U.S. Army Corps of Engineers, January 1962.

9. Water Resources Council, "Guidelines for Determining Flood Flow Frequency," Bulletin No. 17, Washington, D.C., March 1976.

10. U.S. Department of Commerce, Weather Bureau, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, Washington, D.C., 1961, Revised 1963.

11. U.S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 10 Feet: Ellicottville, New York, 1964; Ashford, New York, 1964; West Valley, New York, 1964; Ashford Hollow, New York, 1964.

12. U.S. Department of Agriculture, Soil Conservation Service, Technical Release No. 20, Computer Program, Project Formulation, Hydrology, Washington, D.C., 1965.

13. U.S. Department of the Interior, Geological Survey, Water Resources Investigations 79-83, Techniques for Estimating the Magnitude and Frequency of Floods in Rural Unregulated Streams in New York State, Excluding Long Island, Washington, D.C., 1979.

14. Water Resources Council, "Guidelines for Determining Flood Flow Frequency," Bulletin No. 17A, Washington, D.C., June 1977.

15. U.S. Department of the Interior, Geological Survey, Flood Height- Drainage Area Relation for 100-Year Flood - New York Basins, December 1973.

16. Lockwood Mapping, Inc., Rochester, New York, Topographic Mapping, Scale 1:2,400, Contour Interval 4 Feet, January 1990.

17. Freeman and Freeman, Land Surveyors, Location Map of Improvements and Topographic Features, Future Wildflower Development, Part of Lot 37, T4 R6, Town of Ellicottville, Cattaraugus County, New York, Scale 1''=60', Contour Interval 5 Feet, dated October 18, 1990.

18. Freeman and Freeman, Land Surveyors, untitled topographic map, Scale 1''=200', Contour Interval 5 Feet, undated.

19. U.S. Department of Agriculture, Soil Conservation Service, Technical Release No. 61, WSP-2 Computer Program, Washington, D.C., May 1976.

20. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Davis, California, September 1988.

21. Federal Emergency Management Agency, Flood Insurance Study, Village of Ellicottville, Cattaraugus County, New York, Washington, D.C., May 2, 1994.

22. U.S. Department of Agriculture, Soil Conservation Service, National Engineering Handbook, Section 4, "Hydrology," and Section 5, "Hydraulics."

23. Lockwood-Kessler-Bartlett, Aerial Photographs, Syossett, New York, 1975.

24. Freeman and Freeman, Land surveyors, Topographic Map, Existing Motel Site, Holiday Valley Ski Resort, Ellicottville, New York, Scale 1''=40', Contour Interval 2 Feet, dated September 10, 1993.

25. Lockwood Mapping Inc. and John Kozma, Topographic Mapping, Village of Ellicottville, Sheet 2 of 2, Countour Interval 4 ft., Scale 1''=200', September 1991.

26. New York State Department of Transportation, Topographic Mapping, No. D26100, 4 of 21, Contour Interval 5 ft., Scale 1''=200', September 1968.

27. New York State Department of Transportation, Topographic Mapping, No. D26100, 15 of 21, Contour Interval 5 ft., Scale 1"=200", September 1968.

28. Federal Emergency Management Agency, Flood Insurance Study, Town of Ellicottville, Cattaraugus County, New York, Washington, D.C., August 2, 1995.

29. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Town of Franklinville, Cattaraugus County, New York, Washington, D.C., July 17, 1978.

30. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Town of Great Valley, Cattaraugus County, New York, Washington, D.C., July 17, 1978.

31. Federal Emergency Management Agency, Flood Insurance Rate Map, Town of Ashford, Cattaraugus County, New York, Washington, D.C., May 25, 1984.

32. Federal Emergency Management Agency, Flood Insurance Rate Map, Town of East Otto, Cattaraugus County, New York, Washington, D.C., April 20, 1984.

33. Federal Emergency Management Agency, Flood Insurance Rate Map, Town of Machias, Cattaraugus County, New York, Washington, D.C., August 20, 1982.

34. Federal Emergency Management Agency, Flood Insurance Rate Map, Town of Mansfield, Cattaraugus County, New York, Washington, D.C., May 25, 1984.

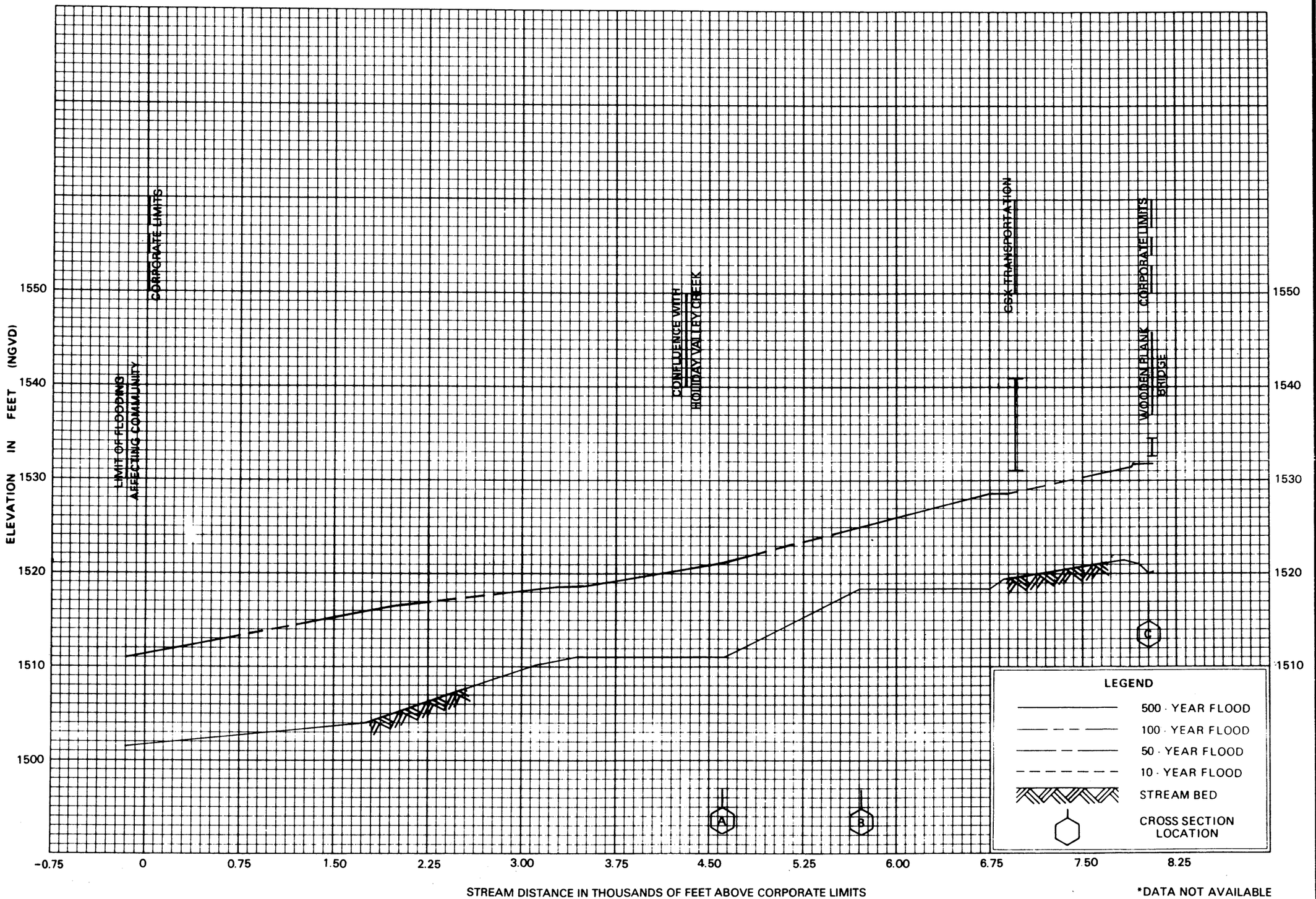
Allegheny River Basin Regional Water Resources Planning Board, Alternatives for Water Resources Development and Management, March 1971.

Allegheny River Basin Regional Water Resources Planning Board, Draft of Comprehensive Water Resources Plan for the Allegheny River Basin, May 1975.

U.S. Department of Agriculture, Soil Conservation Service, Technical Paper 149, A Method for Estimating Volume and Rate of Runoff in Small Watersheds, Washington, D.C., April 1973.

U.S. Department of Agriculture, Soil Conservation Service, Cornell University Agricultural Experiment Station, Generalized Soil Map of New York State, 1967.

U.S. Department of Agriculture, Soil Conservation Service, Community description and local flooding information from officials and long-time area residents.



*DATA NOT AVAILABLE

FLOOD PROFILES

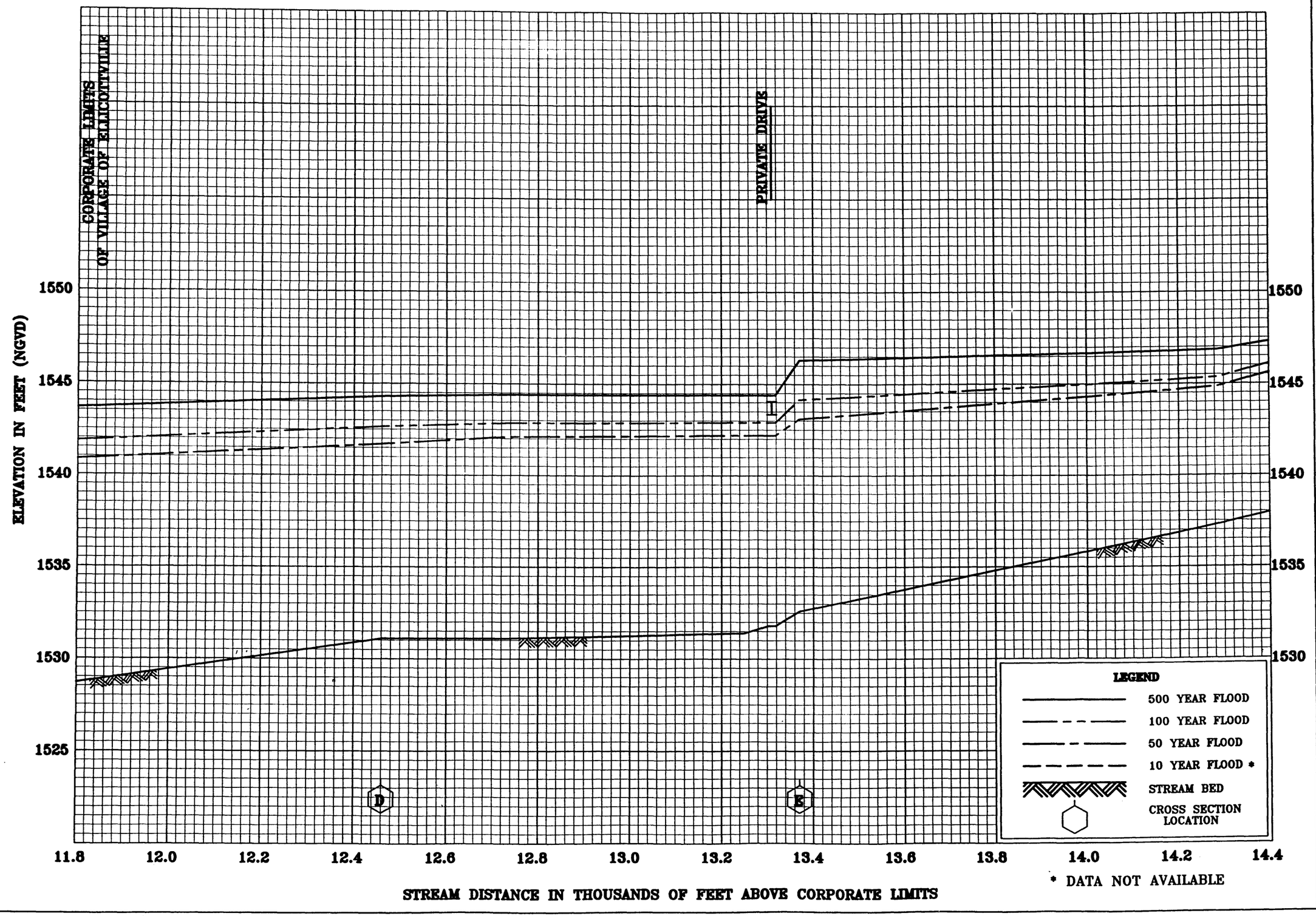
GREAT VALLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF ELLICOTTVILLE, NY

(CATTARAUGUS CO.)

01P



FLOOD PROFILES

GREAT VALLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF ELLICOTTVILLE, NY

(CATTARAUGUS COUNTY)

02P

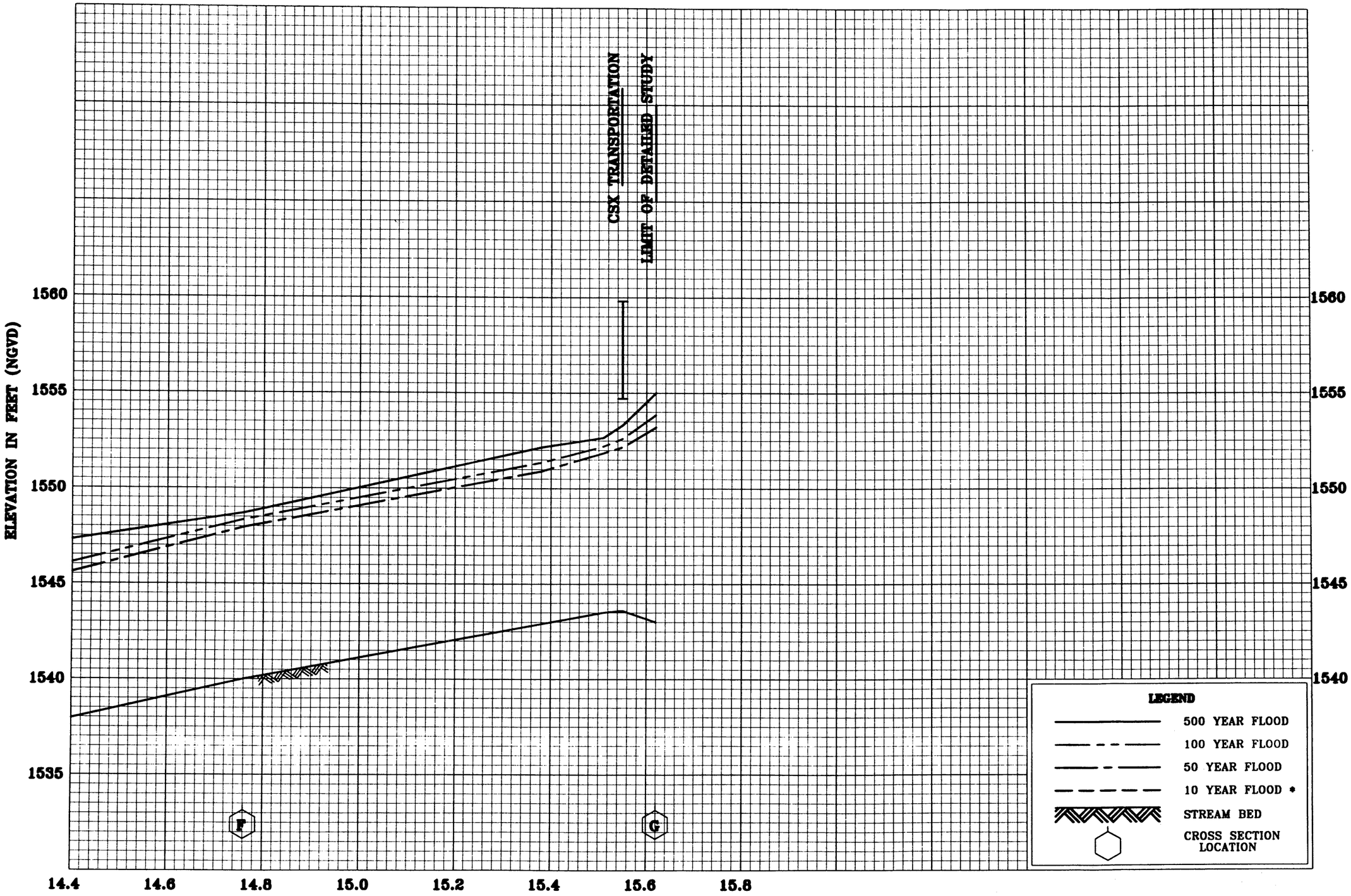
GREAT VALLEY CREEK

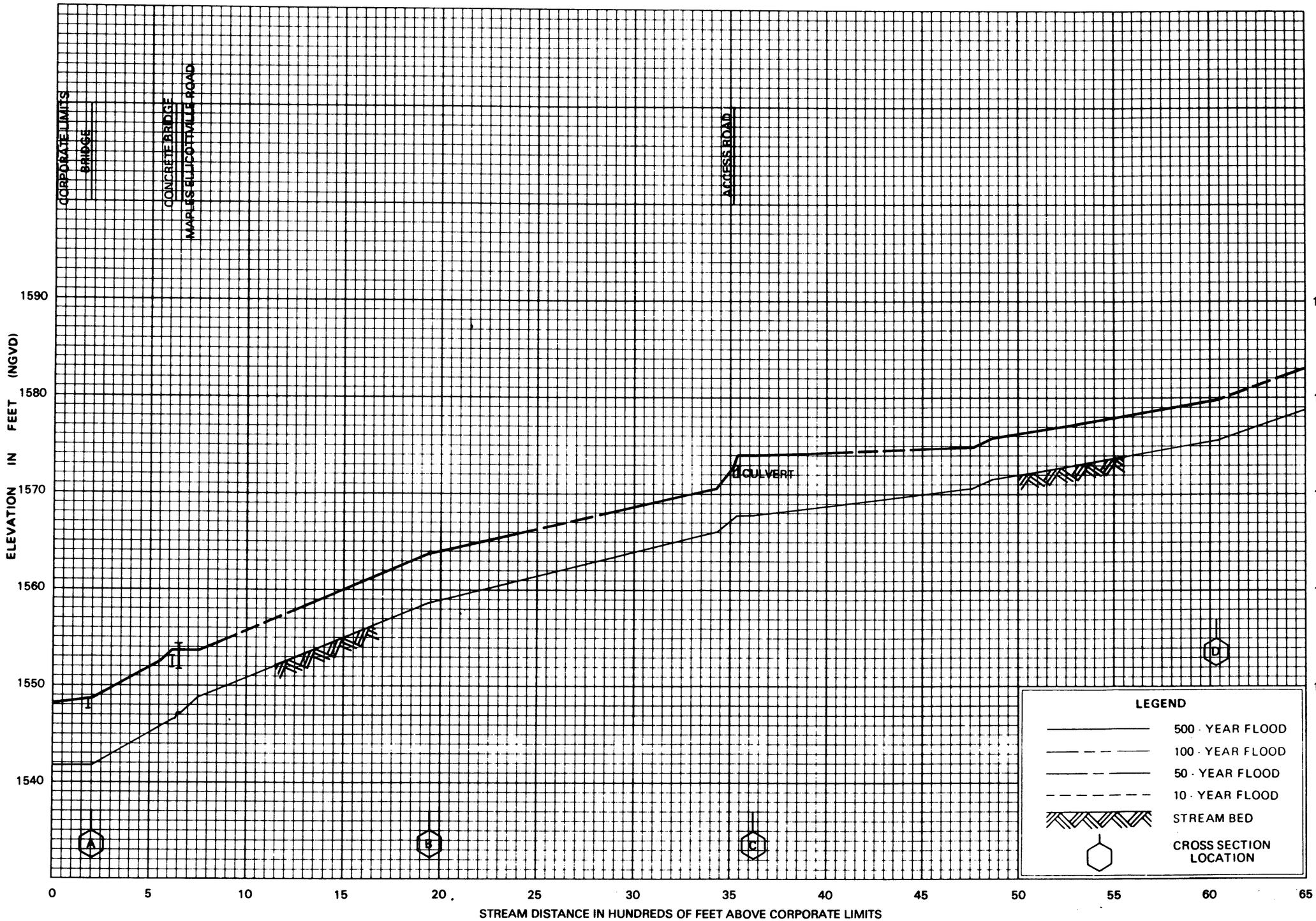
FLOOD PROFILES

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF ELLICOTTVILLE, NY

(CATTARAUGUS COUNTY)





FLOOD PROFILES

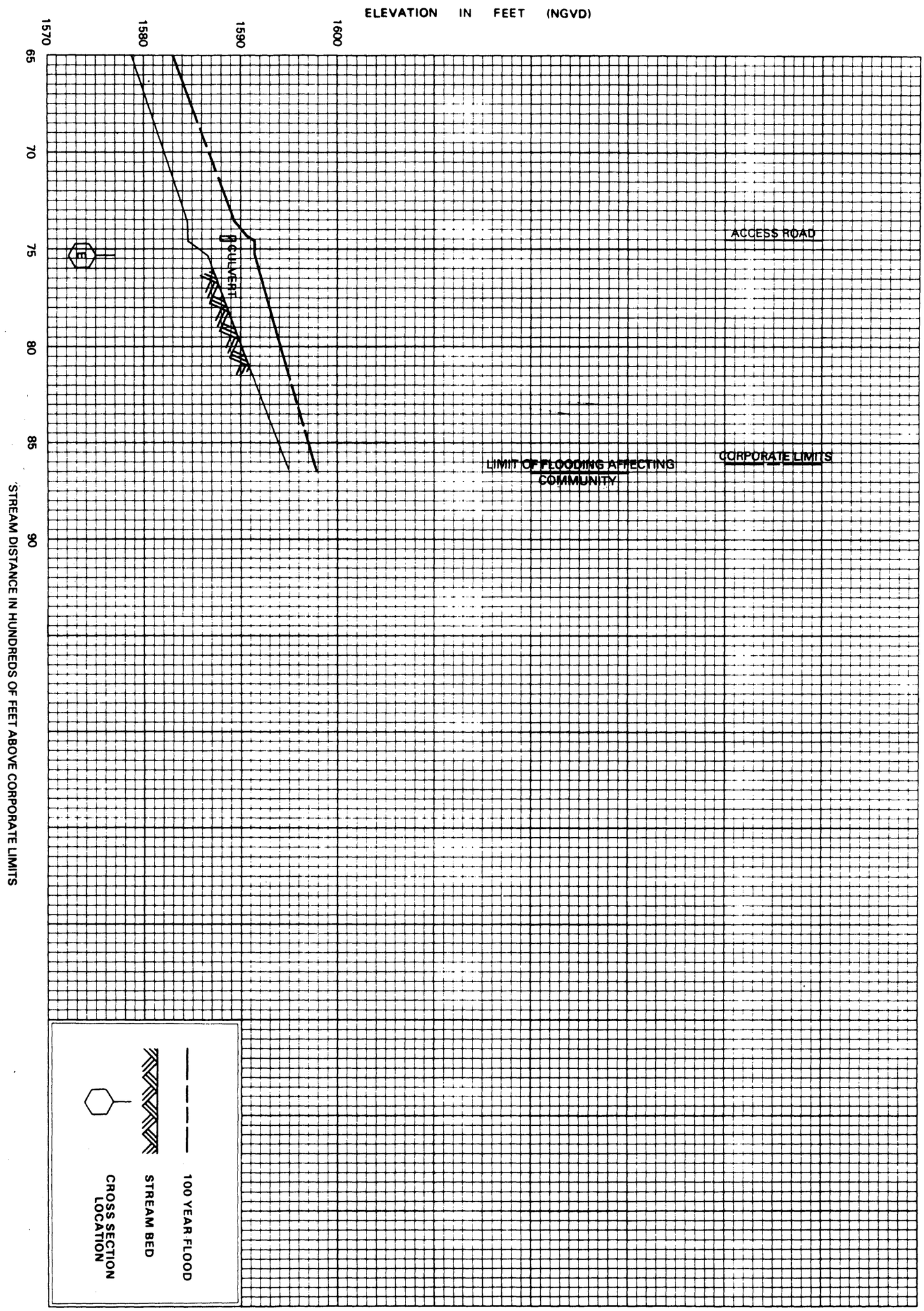
ELK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF ELLICOTTVILLE, NY

(CATTARAUGUS CO.)

04P



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FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF ELLICOTTVILLE, NY

(CATTARAUGUS CO.)

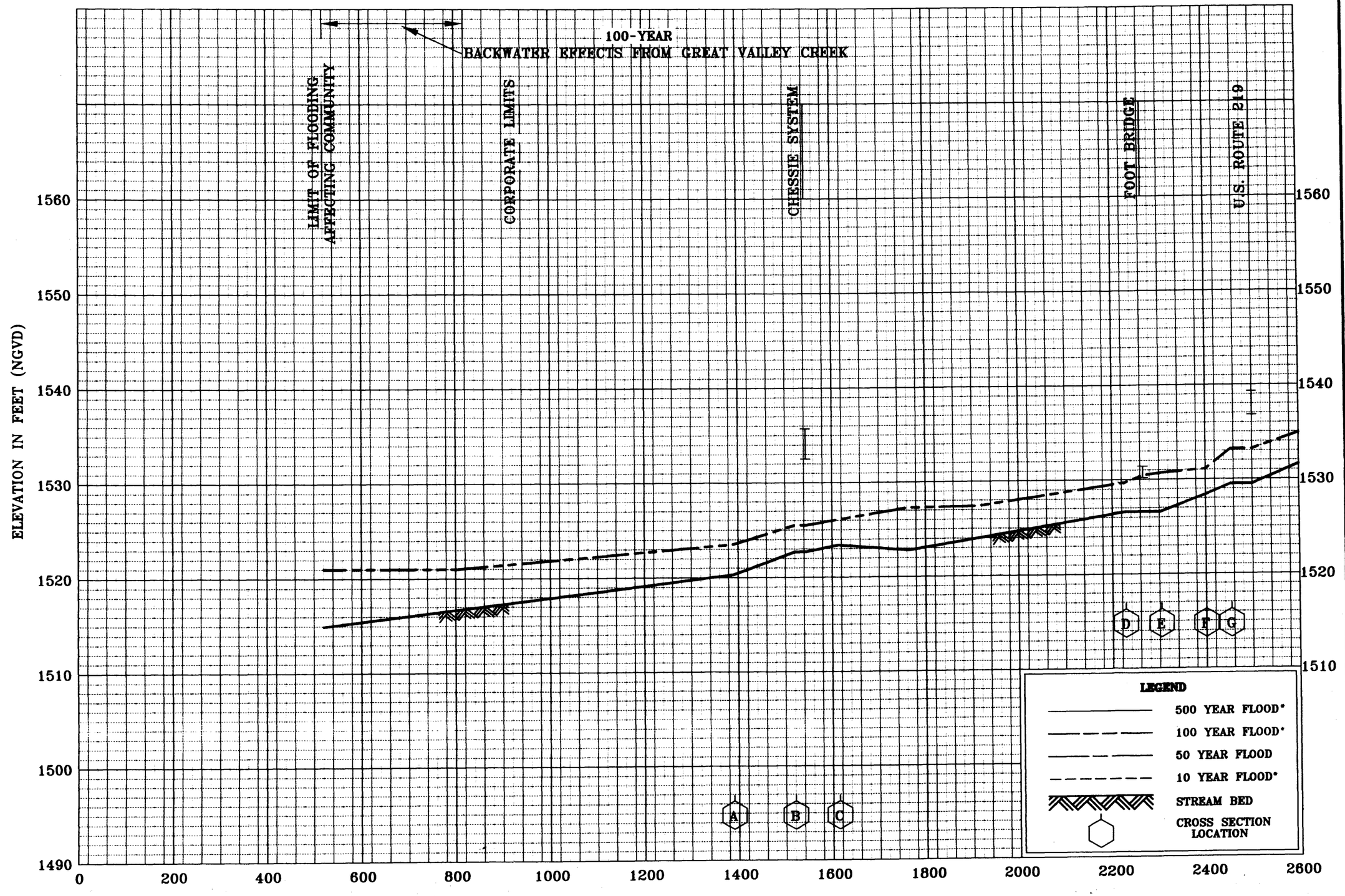
FLOOD PROFILES

ELK CREEK

HOLIDAY VALLEY CREEK

FLOOD PROFILES

FEDERAL EMERGENCY MANAGEMENT AGENCY
TOWN OF ELLICOTVILLE, NY
(CATTARAUGUS COUNTY)



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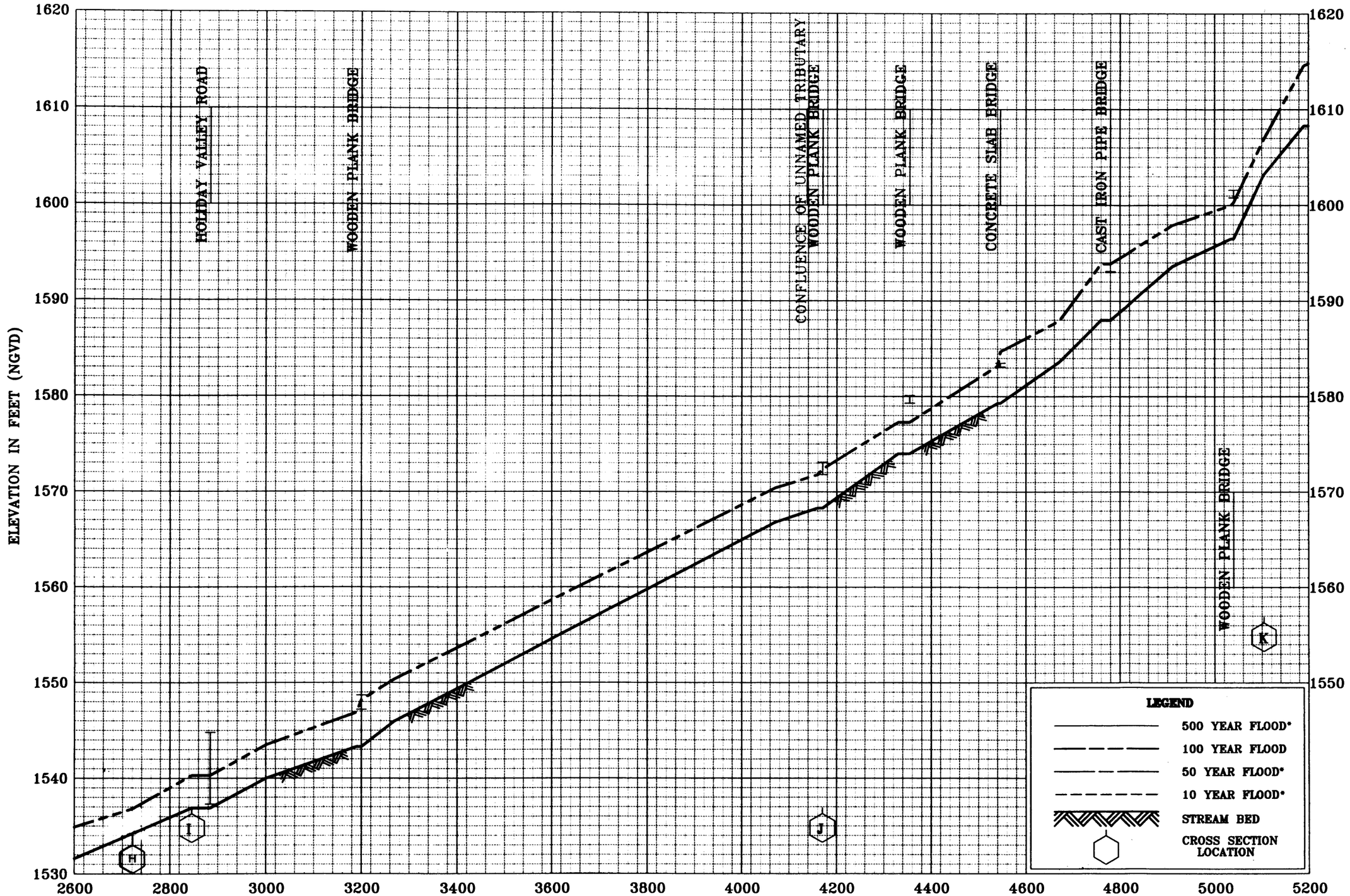


FLOOD PROFILES

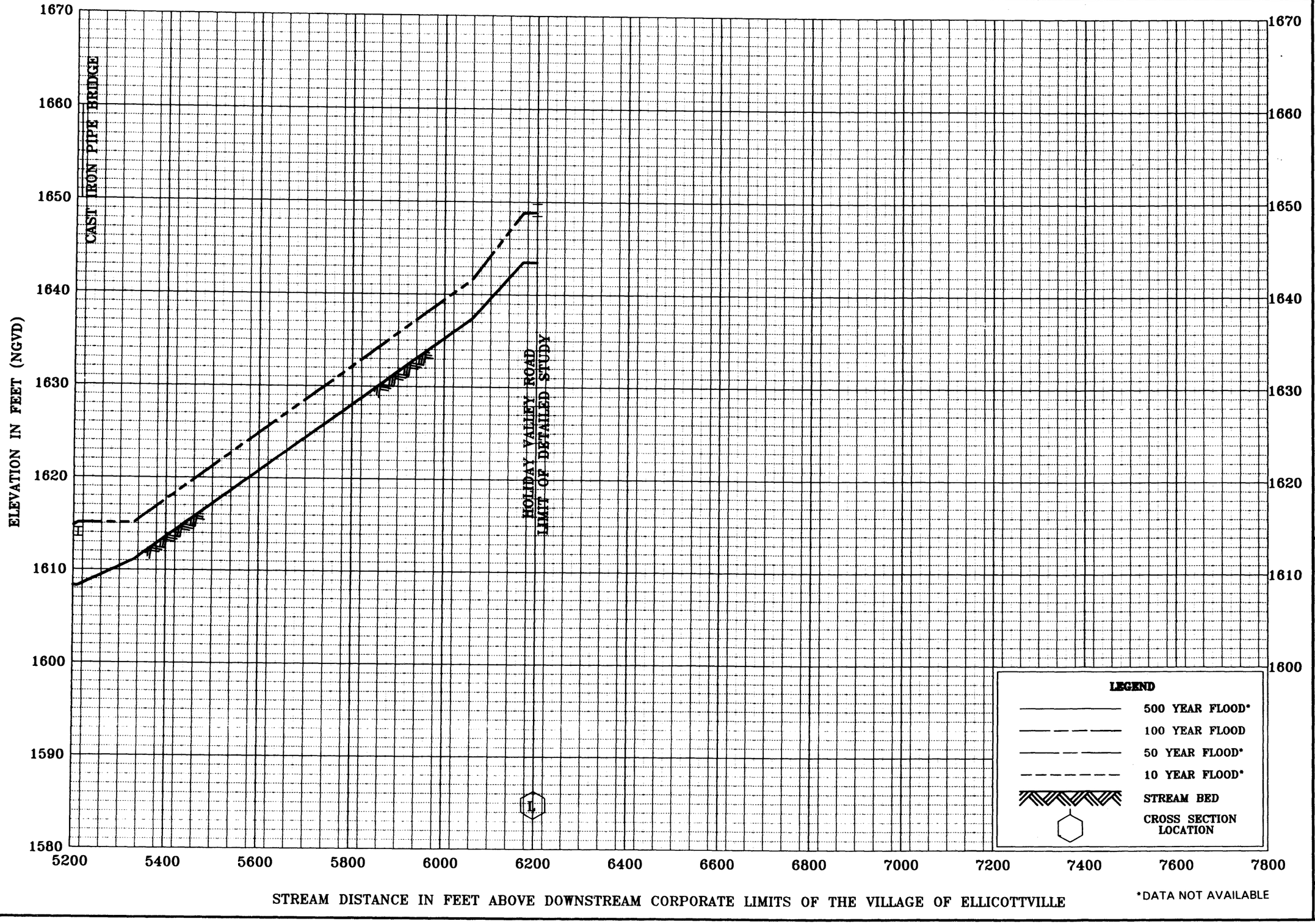
HOLIDAY VALLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF ELLICOTVILLE, NY

(CATTARAUGUS COUNTY)

07P



FLOOD PROFILES

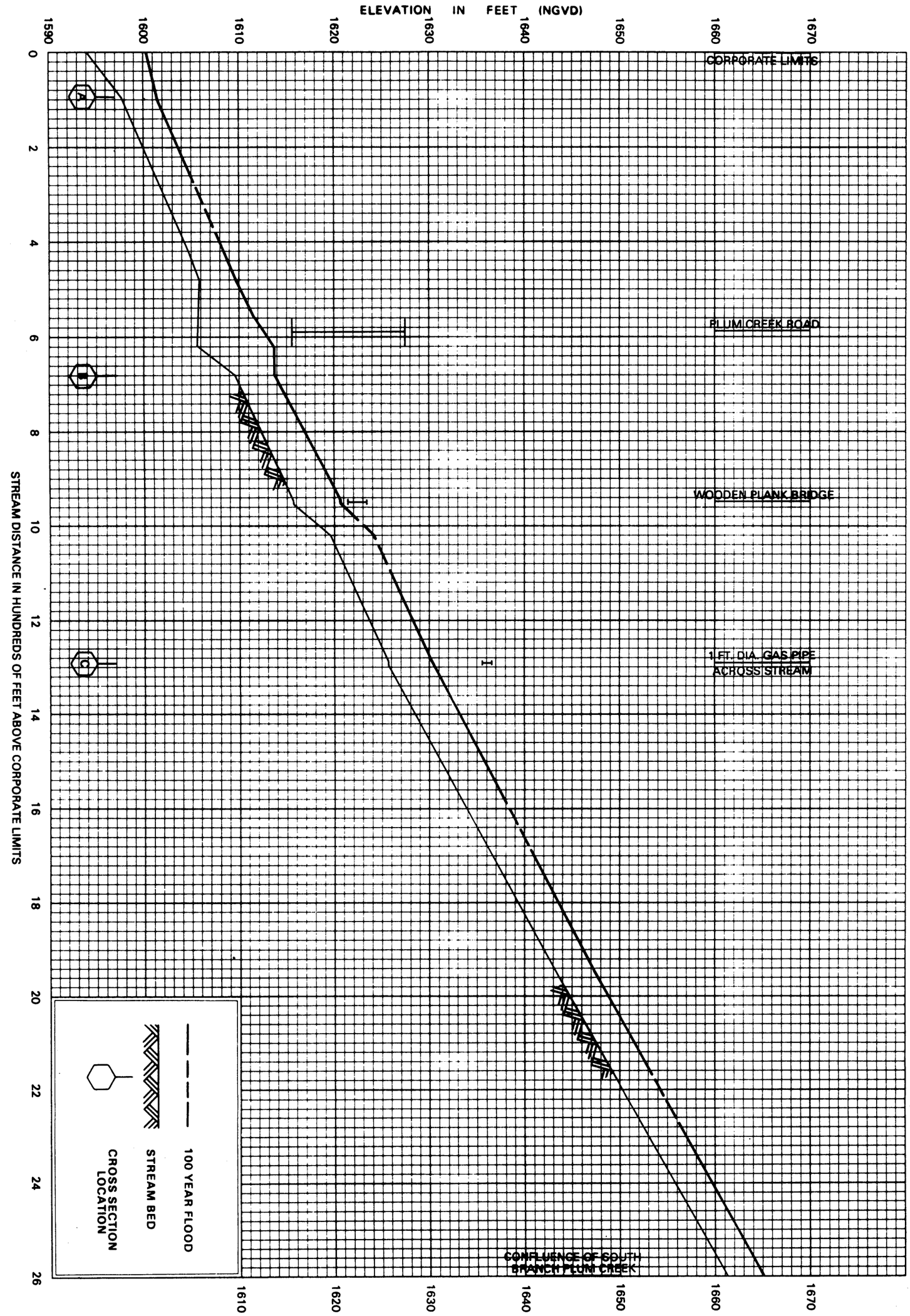
HOLIDAY VALLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF ELLICOTVILLE, NY

(CATTARAUGUS COUNTY)

08P



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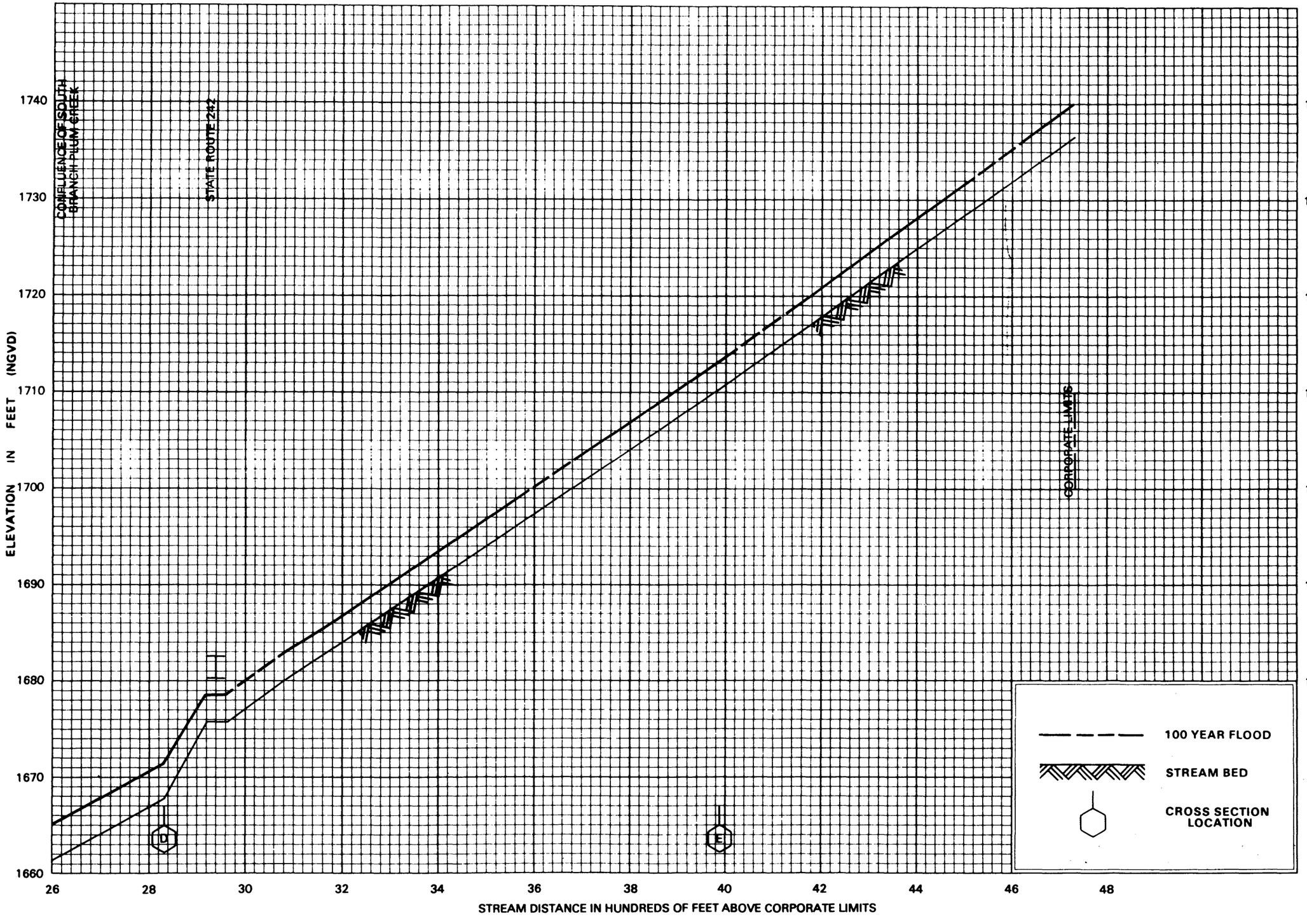
TOWN OF ELLICOTTVILLE, NY
(CATTARAUGUS CO.)

FLOOD PROFILES

PLUM CREEK

09P



FLOOD PROFILES

PLUM CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF ELLICOTTVILLE, NY

(CATTARAUGUS CO.)

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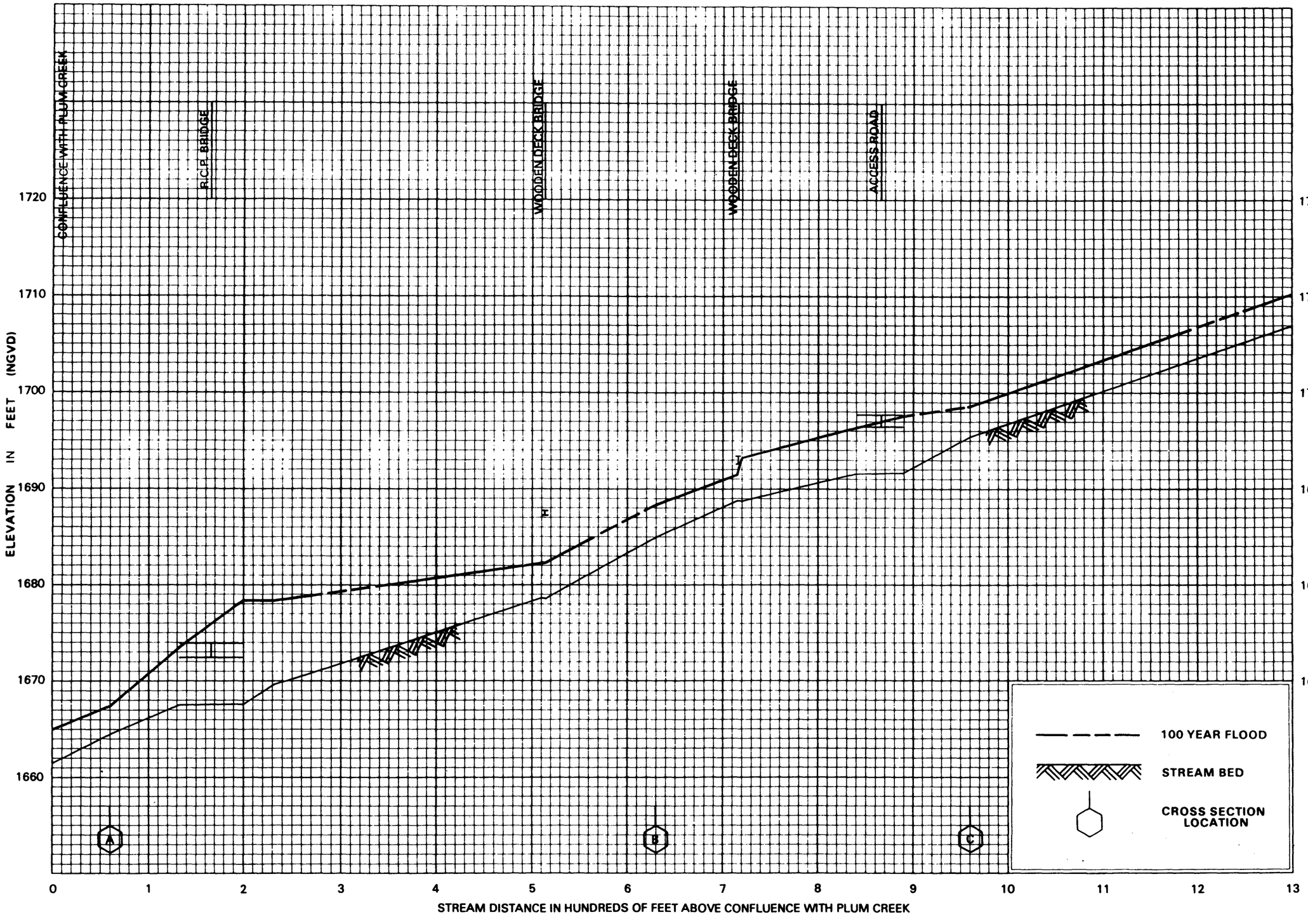

FLOOD PROFILES

SOUTH BRANCH PLUM CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF ELLICOTTVILLE, NY

(CATTARAUGUS CO.)

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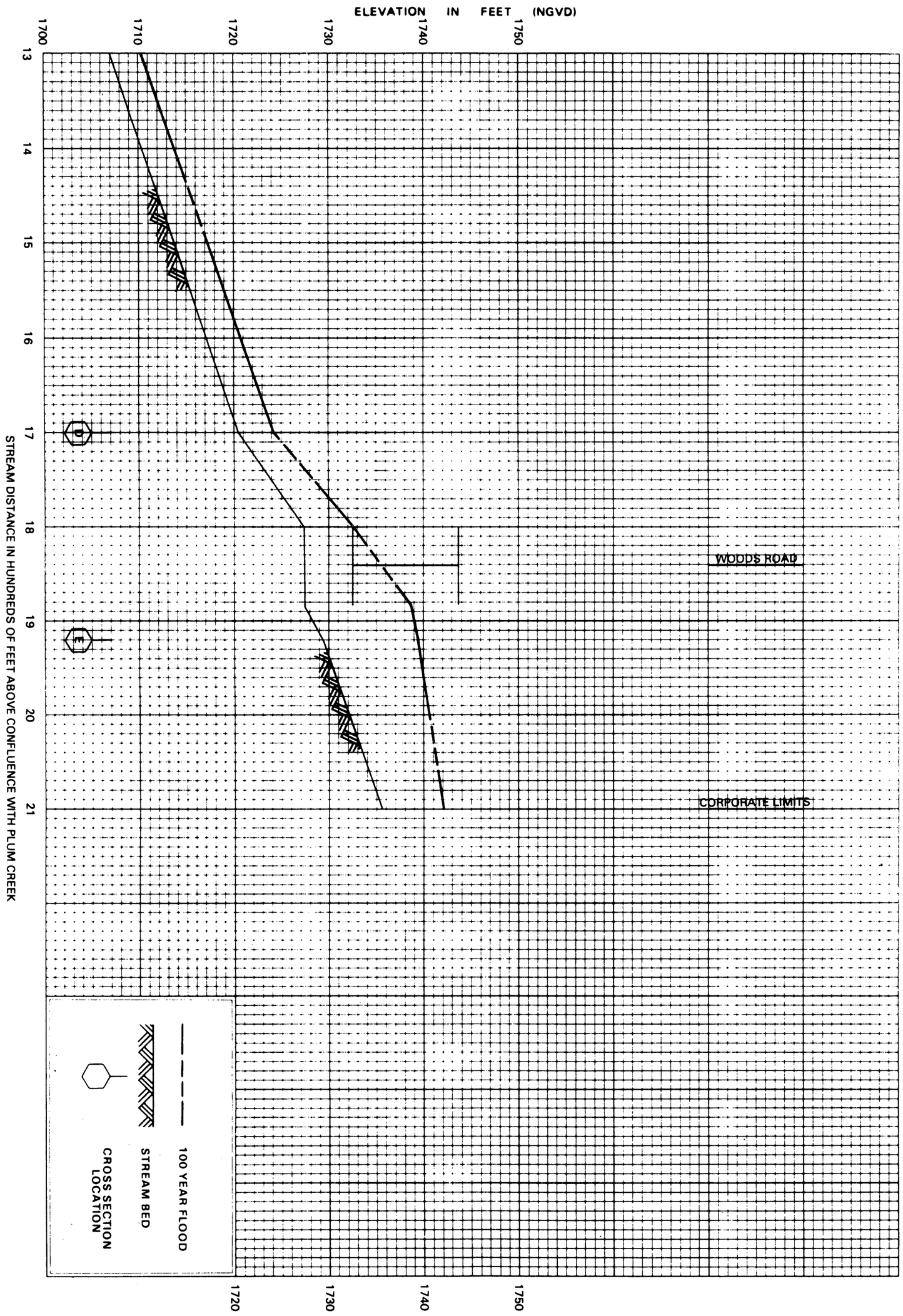

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF ELLICOTTVILLE, NY

(CATTARAUGUS CO.)

FLOOD PROFILES

SOUTH BRANCH PLUM CREEK

12P